UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,510	10/12/2001	Wolf-Dietrich Weber	02998.P017	3990

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EXAMINER
NGUYEN, THAN VINH

ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 12/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
Office Action Summary		09/977,510	WEBER, WOLF-DIETRICH
		Examiner	**Art Unit**	
		Than Nguyen	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _13 September 2004_.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail. Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

1.   This is a response to the amendment, filed 9/13/04.

2.   Claims 1-20 are pending.

Response to Amendment/Arguments

3.   Applicant arguments, filed 9/13/04, are not persuasive to overcome the previous prior art

rejection. Applicant argues that Aref and Rixner does not teach the limitation of maintaining the

issue order of requests within each thread. The Examiner disagrees with Applicant. It appears

that Applicant is reading more into the claim language than that is there. For example, claim 1

has the following limitations:

1) combining scheduling requests between threads and scheduling of requests of initiator access

to the resource

- The Examiner interprets this language to mean: scheduling of requests from

   requesters/initiators. This limitation is satisfied by Aref, who teaches the scheduling

   of requests from initiators (4/14-64). Requests are scheduled for completion.

- Rixner teaches this limitation by performing access scheduling of requests (p. 4/col

   1).

2) maintaining an issue order of at least one of, read and write, requests within each thread

- The Examiner interprets this claim language to mean: maintaining each request by

   tracking each request by the order of which it was issued. This is satisfied by Aref,

   who teaches tracking each request by inserting each into a queue in the order of their

   arrival (first request arrival is inserted into queue 50 before second request arrival is

   inserted into queue 50; 5/50-58). The order that the received request is

   processed/input into the queue is according to its arrival. Thus <u>an</u> order of the request

   is maintained.

- Rixner satisfies this limitation by teaching that, in one simple scheduling algorithm,

   the requests are satisfied in the order that they arrive, thus satisfying the request based

   on the issued order (p.4/col 1/par. 2). This reads directly upon the claimed invention.

4. It appears that Applicant only interpreting "maintaining an issue order of read/write

requests" as "processing the read/write requests in the order that they are issued". These two

limitations are not the same scope. "Maintaining" does not necessary mean "processing". If

Applicant wants to claim the latter, then Applicant should use the latter claim language. In

examining the application, the Examiner will read the claim language as broadly as possible in

determining the scope of the claimed invention. In this case, the Examiner interprets the claimed

language as maintaining each request by tracking each request by the order of which it was

issued. With this broad interpretation, the Aref reference reads upon the claimed invention. The

Examiner maintains the previous rejection to the claims. Even with Applicant's interpretation,

Rixner directly teaches that the requests are satisfied in the order that they arrive (p. 4/col 1/par.

2).

5.   It should be noted that the claim language calls for "an issue order". This could be interpreted very broadly as any order, designated/named as an issue order. It would also be better for Applicant to set antecedence basis by indicating an issue order of the requests and then later claiming "the issue order of the requests", thereby setting a standard for reference.

Claim Rejections - 35 USC § 102

6.   Claims 1-3,9,10,12,18,19 are rejected under 35 U.S.C. 102(b) as being anticipated by Aref et al (USP 6,023,720).

As to claims 1,2,10,12,18:

7.   Aref teaches a disk scheduling system. Aref teaches scheduling access to a resource comprising: combining quality of service (QOS) scheduling for processing request threads, that substantially maintains QOS for each thread, and resource scheduling, that substantially maximizes resource efficiency (guaranteeing QOS by efficient resource scheduling; 4/14-64). Aref teaches substantially maintaining QOS for each request thread by maintaining/guaranteeing QOS to the access/read requests (MSFS 12; 4/14-33). Aref teaches resource scheduling to maximize resource efficiency by performing resource/disk scheduling to minimize seek time and guaranteeing data delivery at specified time(4/34-64). Aref teaches maintaining the issue order of the requests (5/50-55, 6/24-35). The read/write request is inserted into the queue, thus maintaining the order of issue/insertion.

As to claim 3,19:

8.   Aref teaches the stages are ordered to determine an order of requests to meet QOS

guarantees and determine an order of requests for resource efficiency such that if the

resource efficiency order satisfies QOS guarantees, a request is scheduled according to a

first resource efficiency order, else a request is schedule in accordance with a second

resource efficiency order (schedule request based on EDF algorithm to guarantee QOS;

4/5-39).

9.   Claims 1-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Rixner

(Memory Access Scheduling, 2000).

As to claims 1,2,10,11,12,18:

10.   Rixner teaches combining scheduling of requests and scheduling of request and

maintaining order of requests while maintaining QOS scheduling and resource scheduling

(memory access scheduler, pg. 2 col 2 - pg. 3 col 1; pg. 4 col 1).   Rixner teaches

maintaining the order of issue request (pg. 4 col 1, par. 2). The request is

satisfied/scheduled in the order of arrival/issued.

As to claim 3,19:

11.   Rixner teaches determining an order of requests to meet QOS guarantees

(scheduling base on request arrival; pg. 1 col 1; pg. 7 col 2 - pg. 8 col 1);

        determining an order of requests for resource efficiency (pick scheduling policy;

pg. 4 col 2, Table 1); and

        if the resource efficiency order satisfies QOS guarantees, and order is maintained,

scheduling a request according to a first resource efficiency order, else scheduling with a

second resource efficiency order (pick best scheduling policy; pg. 4 col 2 , Table 1).

As to claims 4-6,13-15:

12.   Rixner teaches maintaining and using a thread scheduling/access

history(bandwidth usage), to determine scheduling of threads (use most pending policy

schedules access base based on the most demanded row which means that a history is

kept of the bandwidth usage to determine which is the most demanded/highest

bandwidth; Table 1).

As to claim 7:

13.   Rixner teaches maintaining prioritizing threads according to bandwidth usage and

sequencing requests (use most priority policy which schedules access base based on the

most highest priority operations.; Table 1).

As to claim 8,16:

14.   Rixner teaches scheduling based on cost-function scheduling (fewest pending

policy which weighs fewest pending and most pending policies to perform access; Table

1).

As to claim 9,17,20:

15.   Rixner teaches scheduling for DRAM and deciding which bank to use (memory

access scheduling for DRAM; pg. 1 col 2; pg. 3-4).

Conclusion

16.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of

time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than

SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Than Nguyen whose telephone number is 571-272-4198.

The examiner can normally be reached on 8am-3pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Donald Sparks can be reached on (571)272-4201. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

Than Nguyen
Examiner
Art Unit 2187

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.

EXAMINER

ART UNIT	PAPER

20041130

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Than Nguyen
Examiner
Art Unit: 2187